Sep 03, 07 4:48 **x3_9.sas** Page 1/1

```
/* x3_9.sas */
/* Purpose:  */

title1 'Example 3.9.';

data temp;
input y my1 th11 th12 th21;
cards;
  0 1 1 0 0
 -2 1 1 0 0
-19 1 0 1 0
-15 1 0 1 0
 -6 0 0 0 1
  0 0 0 0 1
 -2 0 0 0 1
;

proc print;
title1 'Print af data fra eks 3.5';

proc glm;
model y = my1 th11 th12 th21 /noint solution xpx inverse;
title2 'Analysis by GLM. Full model.';

proc glm;
model y = my1 th11 th12 /noint solution xpx inverse;
title2 'Analysis by GLM. Reduced model.';

run;
```

```
                   Print af data fra eks 3.5                                 1

           Obs      y    my1    th11    th12    th21

             1      0     1       1       0       0
             2     -2     1       1       0       0
             3    -19     1       0       1       0
             4    -15     1       0       1       0
             5     -6     0       0       0       1
             6      0     0       0       0       1
             7     -2     0       0       0       1

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                   Print af data fra eks 3.5                                 2
                  Analysis by GLM. Full model.

                       The GLM Procedure

            Number of Observations Read           7
            Number of Observations Used           7

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                   Print af data fra eks 3.5                                 3
                  Analysis by GLM. Full model.

                       The GLM Procedure

                         The X'X Matrix

                    my1         th11         th12         th21            y

my1                   4            2            2            0          -36
th11                  2            2            0            0           -2
th12                  2            0            2            0          -34
th21                  0            0            0            3           -8
y                   -36           -2          -34           -8          630

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                   Print af data fra eks 3.5                                 4
                  Analysis by GLM. Full model.

                       The GLM Procedure

                  X'X Generalized Inverse (g2)

                    my1         th11         th12         th21            y

my1                 0.5         -0.5            0            0          -17
th11               -0.5            1            0            0           16
th12                  0            0            0            0            0
th21                  0            0            0 0.3333333333 -2.666666667
y                   -17           16            0 -2.666666667 28.666666667
```



```
                   Print af data fra eks 3.5                                 5
                  Analysis by GLM. Full model.

                       The GLM Procedure

Dependent Variable: y

                                        Sum of
 Source                      DF        Squares    Mean Square   F Value   Pr > F

 Model                        3    601.3333333    200.4444444     27.97   0.0038

 Error                        4     28.6666667      7.1666667

 Uncorrected Total            7    630.0000000


              R-Square     Coeff Var      Root MSE        y Mean

              0.954497     -42.58964      2.677063     -6.285714

NOTE: No intercept term is used: R-square is not corrected for the mean.


 Source                      DF      Type I SS    Mean Square   F Value   Pr > F

 my1                          1    324.0000000    324.0000000     45.21   0.0025
 th11                         1    256.0000000    256.0000000     35.72   0.0039
 th12                         0      0.0000000         .            .       .
 th21                         1     21.3333333     21.3333333      2.98   0.1596


 Source                      DF    Type III SS    Mean Square   F Value   Pr > F

 my1                          0     0.00000000         .            .       .
 th11                         0     0.00000000         .            .       .
 th12                         0     0.00000000         .            .       .
 th21                         1    21.33333333    21.33333333      2.98   0.1596


                                             Standard
      Parameter         Estimate                Error    t Value    Pr > |t|

      my1           -17.00000000 B      1.89296945      -8.98      0.0009
      th11           16.00000000 B      2.67706307       5.98      0.0039
      th12            0.00000000 B       .                .         .
      th21           -2.66666667        1.54560308      -1.73      0.1596

NOTE: The X'X matrix has been found to be singular, and a generalized inverse
      was used to solve the normal equations.  Terms whose estimates are
      followed by the letter 'B' are not uniquely estimable.

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                   Print af data fra eks 3.5                                 6
                  Analysis by GLM. Reduced model.

                       The GLM Procedure

            Number of Observations Read           7
            Number of Observations Used           7
```

```
                     Print af data fra eks 3.5                                  7
                  Analysis by GLM. Reduced model.

                         The GLM Procedure

                          The X'X Matrix

                         my1              th11              th12                 y

my1                        4                 2                 2               -36
th11                       2                 2                 0                -2
th12                       2                 0                 2               -34
y                        -36                -2               -34               630

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                     Print af data fra eks 3.5                                  8
                  Analysis by GLM. Reduced model.

                         The GLM Procedure

                    X'X Generalized Inverse (g2)

                         my1              th11              th12                 y

my1                      0.5              -0.5                 0               -17
th11                    -0.5                 1                 0                16
th12                       0                 0                 0                 0
y                        -17                16                 0                50
```



```
                     Print af data fra eks 3.5                                  9
                  Analysis by GLM. Reduced model.

                         The GLM Procedure

Dependent Variable: y

                                         Sum of
 Source                      DF         Squares     Mean Square    F Value    Pr > F

 Model                        2     580.0000000     290.0000000      29.00    0.0018

 Error                        5      50.0000000      10.0000000

 Uncorrected Total            7     630.0000000


               R-Square     Coeff Var      Root MSE        y Mean

               0.920635     -50.30896      3.162278     -6.285714

NOTE: No intercept term is used: R-square is not corrected for the mean.


 Source                      DF       Type I SS     Mean Square    F Value    Pr > F

 my1                          1     324.0000000     324.0000000      32.40    0.0023
 th11                         1     256.0000000     256.0000000      25.60    0.0039
 th12                         0       0.0000000          .             .       .


 Source                      DF     Type III SS     Mean Square    F Value    Pr > F

 my1                          0               0              .          .       .
 th11                         0               0              .          .       .
 th12                         0               0              .          .       .


                                                  Standard
      Parameter           Estimate                   Error    t Value    Pr > |t|

      my1             -17.00000000 B        2.23606798      -7.60      0.0006
      th11             16.00000000 B        3.16227766       5.06      0.0039
      th12              0.00000000 B         .                .         .

NOTE: The X'X matrix has been found to be singular, and a generalized inverse
      was used to solve the normal equations.  Terms whose estimates are
      followed by the letter 'B' are not uniquely estimable.
```